PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-092484

(43)Date of publication of application : 09.04.1996

(51)Int.Cl. C08L 83/06
A61K 7/02
A61K 7/42
C08J 7/16
C08K 9/06
C09C 3/12

(21)Application number : 06-249988

(22)Date of filing : 19.09.1994

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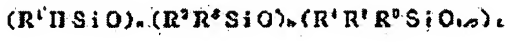
(54) PRODUCTION OF TREATED POWDER

(57)Abstract:

PURPOSE: To obtain a stable modified powder which is environmentally safe and producible at a reduced cost by coating powder particles with a silicone compound having one or more Si-H groups and using water only as a reaction solvent to cause an addition reaction between the silicone compound and a compound reactive with an Si-H group.



CONSTITUTION: Powder particles of an organic pigment, inorganic pigment, mica, magnetic material, titanium dioxide, talc, or the like which have a particle diameter of about 10mm or smaller are coated with a silicone compound having at least one Si-H group and represented by the formula (wherein R1 to R6 each is H or a 1-10C hydrocarbon group optionally substituted with a halogen; (a) and (b) each is an integer of 0 or larger; (c) is 0 or 2; and $3 \leq (a+b+c) \leq 10,000$). A compound having at least one carbon-carbon double or triple bond and reactive with an Si-H group is reacted with the silicone compound at the Si-H group by an addition reaction using a reaction solvent consisting substantially of water. Thus, a modified powder is obtained, which

is used as a component of a cosmetic preparation, a coating composition, a molded resin article, etc.

LEGAL STATUS

[Date of request for examination]	07.11.2000
[Date of sending the examiner's decision of rejection]	
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	3478607
[Date of registration]	03.10.2003
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the manufacture approach of processing fine particles, in case it adds a Si-H radical reactivity compound to the fine particles covered with the silicone compound which has a Si-H radical in more detail, without using an organic solvent as a reaction solvent, by using only water substantially, is environment top insurance and relates to the manufacture approach of safe and stable processing fine particles that the manufacturing cost was reduction-ized.
[0002] In fields, such as a coating, ink, cosmetics, and a medical ingredient, the processing fine particles manufactured by this invention are not only used as a coloring agent, but may be broadly utilized for a magnetic material, the column packing material for gas chromatographs, a catalyst, etc.
[0003]
[Description of the Prior Art] In fields, such as a coating, ink, cosmetics, a magnetic material, and a medical ingredient, many reforming fine particles introduced the functional group etc. into fine particles and various kinds of properties and functions were made to give are used.
[0004] When a functional group was conventionally introduced into fine particles, generally the silane coupling agent was used. However, when the reforming fine particles obtained by this were blended with cosmetics etc., caused problems, such as deterioration and a stench, it lived together, and also problems, such as causing deterioration of a component, decomposition, etc., might be produced.
[0005] On the other hand, these people have completed invention of a header and reforming fine particles for fine particles with the property (for example, hydrophobicity, stability) improved with the property of fine-particles original maintained being obtained by making this Si-H radical and the compound which can react already add to the Si-H radical of said silicone polymer after covering fine particles by the silicone polymer coat which has a Si-H radical (JP,1-54380,B). Here, generally the addition reaction to the Si-H radical of the silicone polymer of the above-mentioned Si-H radical reactivity compound is known as a hydrosilylation reaction, and organic solvents, such as isopropyl alcohol (IPA), dioxane, and toluene, are usually used as a reaction solvent. Moreover, in JP,1-110540,A, the manufacture approach of performing the above-mentioned addition reaction using the reaction solvent (water: ethanol =1:1) containing water is indicated.
[0006] However, when organic solvents, such as dioxane and toluene, are used in a hydrosilylation reaction, it remains in processing fine particles and is hard to remove. Moreover, these solvents have the problem that the burden on an activity is placed on the processing at many economy top lists, on an environmental cure in the waste water treatment after use. Moreover, even when a reaction solvent is made to contain water, just the difference of extent cannot solve that and the above-mentioned problem completely.
[0007]
[Problem(s) to be Solved by the Invention] In the approach of adding a Si-H radical reactivity compound to the fine particles covered with the silicone compound which has a Si-H radical, and manufacturing reforming fine particles, the place which this invention was made in view of the above-mentioned

situation, and is made into the purpose is environment top insurance, and is to offer the manufacture approach of the safe and stable processing fine particles which reduction-ized the manufacturing cost.
[0008]
[Means for Solving the Problem] As a result of repeating research wholeheartedly, by using only water substantially as a solvent of hydrosilylation reaction time, this invention persons acquire the knowledge that the height of a reaction rate or an addition consistency can also be performed better to the same extent as the former than it, and they not only can solve the above-mentioned technical problem, but came to complete this invention based on this.
[0009] That is, this invention offers the manufacture approach of the processing fine particles characterized by performing said addition to a part for the Si-H base of this silicone compound substantially after covering fine particles in the manufacture approach of a Si-H radical and the processing fine particles which add the compound which can react with the silicone compound which has a Si-H radical, using only water as a reaction solvent.
[0010] Moreover, the manufacture approach of the manufacture approach of the product using the processing fine particles obtained by the above-mentioned manufacture approach especially a cosmetics constituent, a coating constituent, and resin fabrication articles (container etc.) is offered.
[0011] Since the processing fine particles obtained by this invention are stable, do not have an interaction with drugs and do not have disintegration to perfume further, when it uses for drugs, cosmetics, etc., its stability with the passage of time improves remarkably. Moreover, since the addition consistency to a Si-H radical and the fine particles of the compound (Si-H radical reactivity compound) which can react is high and control of dispersibility can be performed, the magnetic material which was excellent by processing magnetic fine particles by this invention approach can be obtained. Since separation of the bulking agent for column chromatographs can be raised and the theoretical plate number can be sharply made high by making an addition consistency high further again, it can use for the column packing material for gas chromatographs, the column packing material for liquid chromatographs, etc.
[0012] This invention is considered that the above-mentioned characteristic effectiveness is acquired by using only water substantially as a reaction solvent by distributing the Si-H radical reactivity compound of a non-polarity to the front face of silicone covering fine particles at high concentration etc. Therefore, it is effective also in the hydrosilylation reaction of the Si-H radical reactivity compound which has especially a polar group.
[0013] Hereafter, this invention is explained in full detail.
[0014] Although especially the fine particles used for this invention are not restricted, generally the body (a larger thing than 10mm may also be contained) of arbitration with a particle size of 10mm or less is meant, and, specifically, an organic pigment, an inorganic pigment, a metallic oxide and a metal hydroxide, a mica, a pearl gloss ingredient, a metal, carbon, magnetic powder, a silicate mineral, a porous material, etc. are mentioned in instantiation. At least one kind of these fine particles may be used again combining plurality, and may be floc, a Plastic solid, or a molding object. moreover, a fine-particles top -- or other matter (for example, a coloring agent, UV absorbent, drugs, various additives) may be contained in it. According to this invention, reforming (processing) of the fine particles of arbitration also including a superfines object with a particle size of 0.02 micrometers or less can be carried out.
[0015] As an organic pigment, for example Red No. 201, red No. 202, red No. 204, Red No. 205, red No. 220, red No. 226, red No. 228, red No. 305, Orange No. 203, orange No. 204, yellow No. 205, yellow No. 401, and blue No. 404, Furthermore, red No. 3, red No. 104, red No. 106, red No. 227, red No. 230, Red No. 401, red No. 505, orange No. 205, yellow No. 4, yellow No. 5, yellow No. 202, yellow No. 203, green No. 3, blue No. 1, etc. may be mentioned, and things, such as a zirconium lake, a barium lake, or an aluminium lake, are further sufficient as these organic pigments.
[0016] As an inorganic pigment, Berlin blue, ultramarine blue, manganese violet, a titanium (oxidization) covering mica, bismuth oxychloride, etc. are mentioned, for example.
[0017] As a metallic oxide and a metal hydroxide, for example A magnesium oxide, A magnesium

hydroxide, a calcium oxide, a calcium hydroxide, an aluminum oxide, an aluminum hydroxide, a silica, and an iron oxide (alpha-Fe 2O3 and gamma-Fe 2O3 --) Synthetic Ochre (especially rod-like thing), such as Fe 3O4 and FeO, a red iron oxide, Black iron oxide, an iron hydroxide, titanium oxide (especially titanium dioxide with a particle size of 0.001-0.1 micrometers), Low hypo---ic acid-ized titanium, a zirconium dioxide, chrome oxide, chromium hydroxide, manganese oxide, Cobalt oxide, nickel oxide, the multiple oxide by two or more sorts of such combination and a compound hydroxide, for example, a silica alumina, titanic-acid iron, titanic-acid cobalt, lithium cobalt titanate, ulmin acid cobalt, etc. are mentioned.

[0018] As a mica, it is a muscovite, phlogopite, a biotite, sericite, an iron mica, lepidolite, a lithia mica, a CHINWARUDO mica, a paragonite, synthetic mica or KAl2 O(aluminum and Si3)10F2, KMg3 O (aluminum and Si3)10F2, and K(Mg and Fe3) (aluminum and Si3) O10F2, for example. The mica expressed is mentioned.

[0019] As a pearl gloss ingredient, mica titanium system composite material, mica ferrous-oxide system composite material, bismuth oxy-chloride, a guanine, the mica further covered with the titanium compound containing oxidization titanium nitride and/or low hypo---ic acid-ized titanium are mentioned, for example. About the titanium of mica titanium system composite material, any of a titanium dioxide, low hypo---ic acid-ized titanium, and oxidization titanium nitride are sufficient. Moreover, to mica titanium system composite material or bismuth oxy-chloride, ferrous oxide, Berlin blue, chromic oxide, carbon black, carmine, or ultramarine blue may be mixed further.

[0020] As a metal, aluminum, iron, NIKKERRU, cobalt, chromium, gold, silver, copper, platinum, zinc, an indium, tin, antimony, a tungsten, a zirconium, molybdenum, silicon, titanium, etc. are mentioned, for example.

[0021] As magnetic fine particles, for example Gamma-Fe 2O3 and magnetite (Fe 3O4), Belt light system ferrous oxide (FeOx $1.33<x<1.5$) or they Cobalt, What denaturalized with manganese, nickel, zinc, chromium, etc., the iron powder which iron, or aluminum, B, Co, Cr, Cu, Mo, Mn, nickel, P, Si, needlelike Sn and needlelike Zn contained, and CrO2 Ba ferrite etc. is mentioned.

[0022] Moreover, although powder may be the iron covered on the mica, nickel, cobalt, or its oxide, it is not limited to this.

[0023] as a silicate mineral -- a phyllosilicate mineral (for example, a kaolin group --) They are a montmorillonite group, a clay mica group, a chlorite group, serpentine, and a theque TOKEI acid chloride mineral (for example, zeolite group). Pyrophyllite, talc, chlorite, a chrysotile, antigorite, RIZADAITO, a kaolinite, dickite, nacrite, halloysite, A montmorillonite, nontronite, saponite, a sauconite, and a bentonite, Zeolites, such as heulandite groups, such as natrolite groups, such as natrolite, a mesolite, a SUKORESU zeolite, and a thomsonite, a heulandite, a stilbite, and ******, and analcime, a cross stone, an ashes cross-joint zeolite, chabazite, and a gmelinite, etc. are mentioned.

[0024] Although the porous matter can furthermore be processed good by this invention, after corning or casting the thing which corned or cast a porous glass bead, a hollow silica, a zeolite or a metallic oxide, a metal nitride, the silicate mineral, the carbonate mineral, the sulfate mineral, or the phosphate mineral, or the above-mentioned mineral as porous matter, for example, what was calcinated, metal, a cellulose, fiber, or synthetic resin can be mentioned.

[0025] The silicone compound which has a Si-H radical in the above-mentioned fine particles as the 1st step first is covered with this invention. This silicone compound is a general formula (I) preferably, although any compounds can be used if it has a Si-H radical.

[0026]

[Formula 5]

$$(R^1HSiO)_a(R^2R^3SiO)_b(R^4R^5R^6SiO_{1/2})_c \quad (I)$$

The inside of [type, R1, R2, and R3 are hydrogen atoms mutually-independent, or it is the hydrocarbon group of the replaceable carbon numbers 1-10 by at least one halogen atom. ; R4, (However, R1, R2, and R3 are not hydrogen atoms at coincidence) R5 And R6 is a hydrogen atom mutually-independent, or it is the hydrocarbon group of the replaceable carbon numbers 1-10 by at least one halogen atom, and;a

is 0 or one or more integers. b -- zero -- or -- one -- more than -- an integer -- it is -- c -- zero -- or -- two -- it is (however, it is 3 <=a+b+c<=10000) --; -- and -- this -- a compound -- Si-H -- a base -- a part -- at least -- one -- a piece -- containing -- a thing -- ** -- carrying out --] -- expressing -- having -- silicone -- a compound -- it can use .

[0027] In the case of c= 0, it is the following general formula (III) here.

[0028]

[Formula 6]

$(R^1HSiO)_a(R^2R^3SiO)_b$ (III)

As having defined R1, R2, R3, a, and b above among [type. However, it is R1 and R2 preferably. And R3 It is the low-grade alkyl group or aryl group (for example, phenyl group) of the replaceable carbon numbers 1-4 by at least one halogen atom (especially fluorine atom) mutually-independent,;a+b is three or more, and they are 3-100, and the annular silicone compound especially expressed with] which is 3-7 preferably. That to which two or more hydrogen atoms exist in 1 molecule preferably is desirable. Moreover, since what two hydrogen atoms combined with the silicon atom exists, what has too many hydrogen atoms is difficult to receive. As a concrete example of the compound of a general formula (III), hexa methyl cyclotetrasiloxane, pentamethyl cyclotetrasiloxane, a tetramethyl cyclo TETORASHIROTETORA siloxane, octamethyl cyclopentasiloxane, hepta-methyl cyclopentasiloxane, hexa methyl cyclopentasiloxane, pentamethyl cyclopentasiloxane, methil hydrogen polysiloxane (molecular weight 6000), etc. can be mentioned.

[0029] Moreover, in the case of c= 2, it is the following general formula (IV).

[0030]

[Formula 7]

$(R^1HSiO)_a(R^2R^3SiO)_b(R^4R^5R^6SiO_{1/2})_2$ (IV)

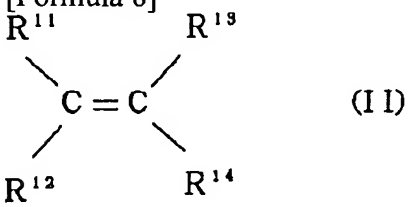
As having defined R1 -R6, a, and b above among [type. However, it is R1 -R6 preferably. It is the low-grade alkyl group or aryl group (for example, phenyl group) of the replaceable carbon numbers 1-4 by at least one halogen atom (especially fluorine atom) mutually-independent, and;a+b is 1-100, and the chain-like silicone compound by which it is especially expressed with] which is 2-5. As an example of a general formula (IV), a 1, 1, 1, 3, 5, 7, 7, and 7-octamethyl tetra-siloxane, 1, 1, 1, 3, 5, 7, 9 and 9, 9-nonamethyl pentasiloxane and 1, 1, 1, 3, 5, 7, 9, 11 and 11, 11-decamethyl hexa siloxane, 1, 3 and 5, 7-tetramethyl cyclotetrasiloxane, etc. can be mentioned.

[0031] Each above-mentioned siloxane has the comparatively low boiling point, and it is suitable for gaseous-phase processing. When performing covering to fine particles by the liquid phase or solid phase, an about [10 <=(a+b+c) <=200] thing is good. Moreover, about 0.01 - 30% of the amount of covering of the above-mentioned silicone compound is desirable to fine particles, and is 0.1 - 10% more preferably.

[0032] Including the covering approach from the former, the fine-particles covering approach of a silicone compound of having the above-mentioned Si-H radical can be enforced by various kinds of approaches, and is not limited especially.

[0033] For example, the above-mentioned silicone compound is dissolved in organic solvents (chloroform, a hexane, benzene, toluene, acetone, etc.), fine particles are distributed in this, dispersion liquid are prepared, these dispersion liquid are heated, a solvent is evaporated, and fine particles can be covered with the coat of a silicone compound by making a coat form on a fine-particles front face. Or said dispersion liquid may be poured out into the poor solvent of the above-mentioned silicone compound, or fine particles may be covered by pouring out a poor solvent, making an insolubilization silicone compound adhere and making the coat form on a fine-particles front face into the dispersion liquid. Or fine particles may be covered by processing liquid-like a silicone compound and fine particles mechanochemical in a ball mill. Furthermore, fine particles may be encapsulated by the coat of a silicone compound like the Inn SAICHU polymerization method by carrying out the polymerization of the silicone compound monomer under existence of a catalyst on the front face of fine particles. Or it

can also cover using the active spot from which it is widely distributed on [all] a front face substantially [fine particles] again.
[0034] In this way, the amount of unreacted Si-H base exists, and the made silicone covering fine particles become instability a little on severe conditions like alkali or an acid.
[0035] Next, as the 2nd step, this Si-H radical and the compound which can react are added to the unreacted Si-H radical of the silicone compound which covered the above-mentioned fine particles. Thereby, a Si-H reactivity compound is added to the unreacted Si-H part of a silicone compound, and the pendant radical guided from a Si-H reactivity compound is introduced into a silicone compound. Various functions can be given to fine particles by choosing a Si-H reactivity compound appropriately and introducing a desired pendant radical.
[0036] Although bridge formation of Si-H radicals will arise on a fine-particles front face, network structure will be formed in the above-mentioned covering process of the 1st step and a fine-particles front face will be covered with the coat of a silicone compound if this is described further, bridge formation is not completely performed for steric hindrance etc. Therefore, the Si-H radical of survival exists and there is an inclination which becomes unstable a little on severe conditions like alkali or an acid. Still more stable fine particles can be obtained to alkali or an acid by making Si-H reactivity compounds (for example, unsaturated compounds, such as an alkene and an alkyne etc.) add to the Si-H radical of this survival by the hydrosilylation reaction, and making Si-C association generate.
[0037] Therefore, various functions can be given to fine particles by choosing Si-H reactivity compounds (unsaturated compound etc.) appropriately, and introducing a desired pendant radical. A "pendant radical" is the residue of a part for a Si-H base, and the compound which can react, and means the radical introduced into a silicone polymer by the addition reaction of the compound here. This pendant radical gives various kinds of properties and functions to fine particles. If a class or die length of a hydrocarbon group of an unsaturated compound made to add is adjusted, hydrophobicity can be strengthened more.
[0038] Any compounds may be used for arbitration if the compounds used in an addition reaction are a Si-H radical and a compound which can react. As such a compound, it can be used, for example, compounds, for example, amino acid, with an OH radical or a sulfhydryl group (cysteine etc.). further -- a carbon-carbon double bond or a triple bond -- it can have one piece, even if few, and a part for a Si-H base and the unsaturated compound (vinyl compound) which can react can be used.
[0039] As a suitable unsaturated compound, it is a general formula (II).
[0040]
[Formula 8]



(II)

Among {type R11, R12, R13, and R14 mutually-independent A hydrogen atom, A halogen atom, a hydroxyl group, a sulfhydryl group, an acyloxy radical, an alkoxy group, the permutation of the amino group, a nitro group, a carboxyl group, a sulfonic group, or carbon numbers 1-30, or an unsubstituted hydrocarbon group -- [-- for example, an aliphatic series radical (for example, an alkyl group --) An alkenyl radical, an alkynyl group, an aromatic series radical (for example, a phenyl group, a naphthyl group), A heterocycle type machine (for example, thing which contains one or more pieces for a nitrogen atom, an oxygen atom, or a sulfur atom as a hetero atom), An alicyclic radical (for example, a cycloalkyl radical, a cyclo alkenyl radical, a cycloalkynyl radical), Are spiro compound residue or terpene compound residue], or;, or R11 and R13 carbon-carbon bonding Nothing, - C=C - together -- becoming - C**C - it can form --; -- or -- R -- 12 -- R -- 14 -- carbon-carbon bonding -- nothing - C -- = -- C - together -- becoming -- alicyclic -- a radical -- it can form --} -- expressing -- having -- a

compound -- etc. -- mentioning -- having .
[0041] The above-mentioned hydrocarbon groups R11-R14 can be permuted by one or more unsaturated hydrocarbon radicals (for example, thing illustrated by the definition of said general formula (II)), and/or one or more functional groups, unless it has disadvantageous effect for the addition reaction by the double bond or triple bond in a compound of a general formula (II). As an example of representation of a functional group, a halogen atom, the amino group, a carboxyl group, a sulfonic group, a sulfhydryl group, an epoxy group, a cyano group, a nitro group, a hydroxyl group, an alkoxy group, an alkoxy carbonyl group, an acyl group, an acyloxy radical, the 4th class ammonium, a polyalkylene ether group, etc. can be mentioned.
[0042] A more desirable unsaturated compound is the alkene or alkyne which has one or more unsaturated bonds (a double bond, triple bond) in the location of an end or arbitration, for example, acetylene, ethylene, a propylene, a butene, octene, decene, octadecene, etc. are mentioned. If the alkene etc. has the unsaturated bond, in order to carry out the addition reaction of it to a Si-H part in the location, cyclic structures, such as a cyclohexane, benzene, and naphthalene, may exist in the other location.
[0043] Moreover, two or more double bonds can also use a certain butadiene, an isoprene, etc.
[0044] In this invention, it faces making the above-mentioned Si-H radical reactivity compound add to the Si-H radical of the silicone compound which covers the above-mentioned fine particles, and the description is in the place which uses only water substantially as a reaction solvent. Although the addition reaction was performed conventionally, using organic solvents, such as IPA, dioxane, and toluene, as this reaction solvent, these solvents remain in processing fine particles, it is hard to remove, and using such processing fine particles as it is has a problem in respect of safety, or many economic burdens had started that processing on the environmental cure in the waste water treatment after solvent use again. Even when a reaction solvent was made to contain water and it was used for it, just in the difference of extent, that and the above-mentioned problem still remained. However, in this invention, since an addition reaction is substantially performed only using water, without using these organic solvents as a reaction solvent, the trouble in the field of safety, the problem on environmental cures, such as waste fluid processing, etc. are solvable. Moreover, the manufacturing cost of processing fine particles can be reduction-ized by replacing with an organic solvent and using water. Also in manufacture effectiveness, product quality, etc., such as a final product, a good result is especially obtained from the ability to carry [that reaction time, an addition consistency, etc. are still more equivalent to the former, or] out to fitness more than it.
[0045] As this addition reaction is the following, it is performed.
[0046] The processing fine particles which passed through the covering process of the 1st step first are mixed with a solvent(water). Since processing fine particles are not easily distributed for hydrophobicity, it stirs at a comparatively quick rotational frequency. While this involves in air gradually, fine particles begin to be mixed with water, and finally it becomes whipped cream-like. Then, it is liquefied, and adds and Si-H radical reactivity compounds, such as an unsaturated compound (vinyl compound), are stirred well, for example. A catalyst is added after a vinyl compound is mixed enough. The processing fine particles (reforming fine particles) which added the desired vinyl compound can be obtained by carrying out a temperature up (300 degrees C or less, preferably 0-250 degrees C) after that, and performing predetermined time (preferably 1 hours or more) stirring. In addition, the Si-H radical reactivity compound to be used can perform an addition reaction by the gaseous phase, the liquid phase, or solid phase. Moreover, it can also carry out using ultraviolet rays, a gamma ray, the plasma, etc.
[0047] In addition, as a catalyst used for the above-mentioned addition reaction, although the compound of a platinum group catalyst, i.e., a ruthenium, a rhodium, palladium, an osmium, iridium, and platinum is suitable, especially the compound of palladium and platinum is suitable. By the palladium system, a palladium(II) chloride, chlorination tetra-amine palladium (II) acid ammonium, oxidization palladium (II), hydroxylation palladium (II), etc. are mentioned. By the platinum system, a platinum chloride (II), a tetra-platinic chloride (II), a platinum chloride (IV), a hexachloroplatinic acid (IV), hexachloroplatinic-acid (IV) ammonium, platinum oxide (II), platinum hydroxide (II), diacid-ized platinum (IV), platinum

oxide (IV), 2 sulfuration platinum (IV), sulfuration platinum (IV), a hexachloroplatinic(IV) acid potassium, etc. are mentioned. Furthermore, an amine catalyst, for example, tributylamine, or a polymerization initiator can be used.

[0048] According to this invention, the manufacture approach of products, such as a cosmetics constituent using the processing fine particles obtained by the above-mentioned manufacture approach, a coating constituent, and resin fabrication articles (container by injection molding etc.), is offered further. In the manufacture approach of these products, it can replace with the processing fine particles by the conventional method, and each product can be manufactured [except / of using the processing fine particles manufactured by the above-mentioned this invention manufacture approach] with a conventional method. By using the processing fine particles obtained by this invention manufacture approach, final products, such as a cosmetics constituent, a coating constituent, and a container, can aim at mitigation of the load on an activity etc. in the economy top list the stability of reduction of the manufacturing cost of a product, the product article progression in quality, and a product and safety, and in respect of an environmental cure.

[0049] Since this invention persons attained the reaction rate comparable as the time of using an organic solvent, and the addition consistency when they performed the addition reaction of a vinyl compound, using only water as a solvent, they show an example below and explain to a detail further. However, it cannot be overemphasized that the range of this invention is not what is limited in any way by these examples.

[0050]

[Example]

Example 1-1: With a particle size of 50nm silica gel 4kg was put in into the rotating type double cone mold reaction vessel (the product made from stainless steel, with an incubation jacket) with a silicone polymer covering volume [of particle silica gel] of 100l. The temperature of a processing liquid service tank (the product made from stainless steel, with an incubation jacket) with a volume of 10l. made to link with the reaction vessel and it directly was held at 80 degrees C by supplying the heat carrier heated at 80 degrees C to each incubation jacket from a heat carrier heating tub with a circulating pump. Nitrogen gas was supplied to the processing liquid service tank by 1.5l. / min, and bubbling of the processing liquid (1, 3, 5, 7-tetramethyl cyclotetrasiloxane) was carried out. In addition, a condenser is attached in a reaction vessel, nitrogen gas is emitted from there, and it enabled it to collect unreacted processing agents. Moreover, the reaction vessel made it rotate for 1 minute at intervals of 10 minutes, repeated the actuation which mixes particle silica gel within a reaction vessel for 8 hours, and took out processing fine particles. The obtained fine particles showed remarkable hydrophobicity.

[0051] The particle silica gel of one to example 2 example 1-1 was replaced with the particle titanium dioxide, same processing was performed, and the silicone polymer covering particle titanium dioxide was obtained.

[0052] The particle silica gel of one to example 3 example 1-1 was replaced with sericite 10kg, same processing was performed, and the silicone polymer covering sericite was obtained.

[0053] The particle silica gel of one to example 4 example 1-1 was replaced with talc 10kg, same processing was performed, and silicone polymer covering talc was obtained.

[0054] The particle silica gel of one to example 5 example 1-1 was replaced with mica titanium 10kg, same processing was performed, and silicone polymer covering mica titanium was obtained.

[0055] 20g of example 1-6 particle titanium dioxides was put into the planet form ball mill, for 5 minutes, after mixed grinding, methil-hydrogen-polysiloxane (molecular weight 6000) 1g was added, and mixed grinding was performed further for 3 hours. The obtained processing fine particles showed remarkable hydrophobicity.

[0056] The particle titanium dioxide of one to example 7 example 1-6 was replaced with the sericite, same processing was performed, and the silicone polymer covering sericite was obtained.

[0057] The particle titanium dioxide of one to example 8 example 1-6 was replaced with particle silica gel, same processing was performed, and silicone polymer covering silica gel was obtained.

[0058] The particle titanium dioxide of one to example 9 example 1-6 was replaced with the zinc white,

same processing was performed, and the silicone polymer covering zinc white was obtained.
[0059] Example 2-1: Silicone polymer covering particle silica gel 100g of the surface qualification example 1-1 of silicone polymer covering particle silica gel was taken in the 3l. eggplant mold flask, 300g of water was first added to this, the agitator performed high-speed stirring for 10 - 15 minutes, and whip-ization was performed. Next, after having dissolved 2-hydroxy-3-allyl compound-4-methoxybenzophenone 7g, adding 10mg of chloroplatinic acid as a catalyst further and carrying out stirring heating at 80 degrees C among a mantle heater in addition for 6 hours, it filtered, and, subsequently washed by 2l. of ethanol, degassing desiccation was performed, and the processing fine particles by which surface qualification was carried out by the benzophenone were obtained.
[0060] The same surface qualification as an example 2-1 was performed using the silicone polymer covering particle titanium dioxide of two to example 2 example 1-2, and processing fine particles were obtained.
[0061] The same surface qualification as an example 2-1 was performed using the silicone polymer covering sericite of two to example 3 example 1-3, and processing fine particles were obtained.
[0062] The same surface qualification as an example 2-1 was performed using the silicone polymer covering talc of two to example 4 example 1-4, and processing fine particles were obtained.
[0063] The same surface qualification as an example 2-1 was performed using the silicone polymer covering mica titanium of two to example 5 example 1-5, and processing fine particles were obtained.
[0064] The same surface qualification as an example 2-1 was performed using the silicone polymer covering particle titanium dioxide of two to example 6 example 1-6, and processing fine particles were obtained.
[0065] The same surface qualification as an example 2-1 was performed using the silicone polymer covering sericite of two to example 7 example 1-7, and processing fine particles were obtained.
[0066] The same surface qualification as an example 2-1 was performed using the silicone polymer covering particle silica gel of two to example 8 example 1-8, and processing fine particles were obtained.
[0067] The same surface qualification as an example 2-1 was performed using the silicone polymer covering zinc white of two to example 9 example 1-9, and processing fine particles were obtained.
[0068] The silicone polymer covering particle silica gel of three to example 1 example 1-1 is used, and it is an allyl compound about the same actuation as an example 2-1. - It carried out in 3, 4, and 5-trimethoxycinnamate, and processing fine particles were obtained.
[0069] The same surface qualification as an example 3-1 was performed using the silicone polymer covering particle titanium dioxide of three to example 2 example 1-2, and processing fine particles were obtained.
[0070] The same surface qualification as an example 3-1 was performed using the silicone polymer covering sericite of three to example 3 example 1-3, and processing fine particles were obtained.
[0071] The same surface qualification as an example 3-1 was performed using the silicone polymer covering talc of three to example 4 example 1-4, and processing fine particles were obtained.
[0072] The same surface qualification as an example 3-1 was performed using the silicone polymer covering mica titanium of three to example 5 example 1-5, and processing fine particles were obtained.
[0073] The same surface qualification as an example 3-1 was performed using the silicone polymer covering particle titanium dioxide of three to example 6 example 1-6, and processing fine particles were obtained.
[0074] The same surface qualification as an example 3-1 was performed using the silicone polymer covering sericite of three to example 7 example 1-7, and processing fine particles were obtained.
[0075] The same surface qualification as an example 3-1 was performed using the silicone polymer covering particle silica gel of three to example 8 example 1-8, and processing fine particles were obtained.
[0076] The same surface qualification as an example 3-1 was performed using the silicone polymer covering zinc white of three to example 9 example 1-9, and processing fine particles were obtained.
[0077] Using the silicone polymer covering particle silica gel of four to example 1 example 1-1, the

same actuation as an example 2-1 was performed in 2-(2-hydroxy-3-allyl compound-5-methylphenyl) benzotriazol, and processing fine particles were obtained.
[0078] The same surface qualification as an example 4-1 was performed using the silicone polymer covering particle titanium dioxide of four to example 2 example 1-2, and processing fine particles were obtained.
[0079] The same surface qualification as an example 4-1 was performed using the silicone polymer covering sericite of four to example 3 example 1-3, and processing fine particles were obtained.
[0080] The same surface qualification as an example 4-1 was performed using the silicone polymer covering talc of four to example 4 example 1-4, and processing fine particles were obtained.
[0081] The same surface qualification as an example 4-1 was performed using the silicone polymer covering mica titanium of four to example 5 example 1-5, and processing fine particles were obtained.
[0082] The same surface qualification as an example 4-1 was performed using the silicone polymer covering particle titanium dioxide of four to example 6 example 1-6, and processing fine particles were obtained.
[0083] The same surface qualification as an example 4-1 was performed using the silicone polymer covering sericite of four to example 7 example 1-7, and processing fine particles were obtained.
[0084] The same surface qualification as an example 4-1 was performed using the silicone polymer covering particle silica gel of four to example 8 example 1-8, and processing fine particles were obtained.
[0085] The same surface qualification as an example 4-1 was performed using the silicone polymer covering zinc white of four to example 9 example 1-9, and processing fine particles were obtained.
[0086] Using the silicone polymer covering particle silica gel of five to example 1 example 1-1, 4-ant ROKISHI-4'-t-butyl benzoyl methane performed the same actuation as an example 2-1, and processing fine particles were obtained.
[0087] The same surface qualification as an example 5-1 was performed using the silicone polymer covering particle titanium dioxide of five to example 2 example 1-2, and processing fine particles were obtained.
[0088] The same surface qualification as an example 5-1 was performed using the silicone polymer covering sericite of five to example 3 example 1-3, and processing fine particles were obtained.
[0089] The same surface qualification as an example 5-1 was performed using the silicone polymer covering talc of five to example 4 example 1-4, and processing fine particles were obtained.
[0090] The same surface qualification as an example 5-1 was performed using the silicone polymer covering mica titanium of five to example 5 example 1-5, and processing fine particles were obtained.
[0091] The same surface qualification as an example 5-1 was performed using the silicone polymer covering particle titanium dioxide of five to example 6 example 1-6, and processing fine particles were obtained.
[0092] The same surface qualification as an example 5-1 was performed using the silicone polymer covering sericite of five to example 7 example 1-7, and processing fine particles were obtained.
[0093] The same surface qualification as an example 5-1 was performed using the silicone polymer covering particle silica gel of five to example 8 example 1-8, and processing fine particles were obtained.
[0094] The same surface qualification as an example 5-1 was performed using the silicone polymer covering zinc white of five to example 9 example 1-9, and processing fine particles were obtained.
[0095] The processing fine particles by which performed the same actuation as an example 2-1 in tetra-decene, and surface qualification was carried out by the tetradecyl radical were obtained using the silicone polymer covering particle silica gel of six to example 1 example 1-1.
[0096] The same surface qualification as an example 6-1 was performed using the silicone polymer covering particle titanium dioxide of six to example 2 example 1-2, and processing fine particles were obtained.
[0097] The same surface qualification as an example 6-1 was performed using the silicone polymer covering sericite of six to example 3 example 1-3, and processing fine particles were obtained.

[0098] The same surface qualification as an example 6-1 was performed using the silicone polymer covering talc of six to example 4 example 1-4, and processing fine particles were obtained.
[0099] The same surface qualification as an example 6-1 was performed using the silicone polymer covering mica titanium of six to example 5 example 1-5, and processing fine particles were obtained.
[0100] The same surface qualification as an example 6-1 was performed using the silicone polymer covering particle titanium dioxide of six to example 6 example 1-6, and processing fine particles were obtained.
[0101] The same surface qualification as an example 6-1 was performed using the silicone polymer covering sericite of six to example 7 example 1-7, and processing fine particles were obtained.
[0102] The same surface qualification as an example 6-1 was performed using the silicone polymer covering particle silica gel of six to example 8 example 1-8, and processing fine particles were obtained.

[0103] The same surface qualification as an example 6-1 was performed using the silicone polymer covering zinc white of six to example 9 example 1-9, and processing fine particles were obtained.
[0104] The processing fine particles by which performed the same actuation as an example 2-1 in glycerol-alpha-monoallyl ether, and surface qualification was carried out by glycerol residue were obtained using the silicone polymer covering particle silica gel of seven to example 1 example 1-1.
[0105] The same surface qualification as an example 7-1 was performed using the silicone polymer covering particle titanium dioxide of seven to example 2 example 1-2, and processing fine particles were obtained.
[0106] The same surface qualification as an example 7-1 was performed using the silicone polymer covering sericite of seven to example 3 example 1-3, and processing fine particles were obtained.
[0107] The same surface qualification as an example 7-1 was performed using the silicone polymer covering talc of seven to example 4 example 1-4, and processing fine particles were obtained.
[0108] The same surface qualification as an example 7-1 was performed using the silicone polymer covering mica titanium of seven to example 5 example 1-5, and processing fine particles were obtained.
[0109] The same surface qualification as an example 7-1 was performed using the silicone polymer covering particle titanium dioxide of seven to example 6 example 1-6, and processing fine particles were obtained.
[0110] The same surface qualification as an example 7-1 was performed using the silicone polymer covering sericite of seven to example 7 example 1-7, and processing fine particles were obtained.
[0111] The same surface qualification as an example 7-1 was performed using the silicone polymer covering particle silica gel of seven to example 8 example 1-8, and processing fine particles were obtained.
[0112] The same surface qualification as an example 7-1 was performed using the silicone polymer covering zinc white of seven to example 9 example 1-9, and processing fine particles were obtained.
[0113] Silicone polymer covering particle silica gel 100g of eight to example 1 example 1-1 was taken in the 3l. eggplant mold flask, 300g of water was first added to this, the agitator performed high-speed stirring for 10 - 15 minutes, and whip-ization was performed. Next, chloro methyl styrene 6g was added, 10mg of chloroplatinic acid was further added as a catalyst, and heating reflux was performed at 80-90 degrees C among the mantle heater for 5 hours. Then, after adding n-hexyl dimethylamine 5g and carrying out stirring heating at 80 degrees C for 3 hours, it filtered, and, subsequently washed by 2l. of ethanol, degassing desiccation was performed, and the processing fine particles by which surface qualification was carried out with quarternary ammonium salt were obtained.
[0114] The same surface qualification as an example 8-1 was performed using the silicone polymer covering particle titanium dioxide of eight to example 2 example 1-2, and processing fine particles were obtained.
[0115] The same surface qualification as an example 8-1 was performed using the silicone polymer covering sericite of eight to example 3 example 1-3, and processing fine particles were obtained.
[0116] The same surface qualification as an example 8-1 was performed using the silicone polymer covering talc of eight to example 4 example 1-4, and processing fine particles were obtained.

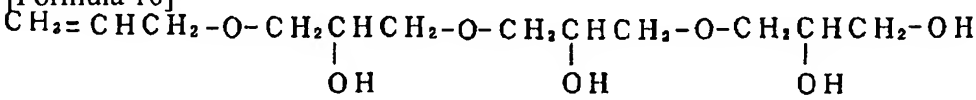
[0117] The same surface qualification as an example 8-1 was performed using the silicone polymer covering mica titanium of eight to example 5 example 1-5, and processing fine particles were obtained.
[0118] The same surface qualification as an example 8-1 was performed using the silicone polymer covering particle titanium dioxide of eight to example 6 example 1-6, and processing fine particles were obtained.
[0119] The same surface qualification as an example 8-1 was performed using the silicone polymer covering sericite of eight to example 7 example 1-7, and processing fine particles were obtained.
[0120] The same surface qualification as an example 8-1 was performed using the silicone polymer covering particle silica gel of eight to example 8 example 1-8, and processing fine particles were obtained.
[0121] The same surface qualification as an example 8-1 was performed using the silicone polymer covering zinc white of eight to example 9 example 1-9, and processing fine particles were obtained.
[0122] Perfluoro octene expressed with the following general formula (IIa) in the same actuation as an example 2-1 using the silicone polymer covering particle silica gel of nine to example 1 example 1-1
[0123]
[Formula 9]

$$CH_2=CH-(CF_2)_5CF_3 \qquad (IIa)$$

It carried out by having been alike and the processing fine particles by which surface qualification was carried out by the perfluoroalkyl radical were obtained.
[0124] The same surface qualification as an example 9-1 was performed using the silicone polymer covering particle titanium dioxide of nine to example 2 example 1-2, and processing fine particles were obtained.
[0125] The same surface qualification as an example 9-1 was performed using the silicone polymer covering sericite of nine to example 3 example 1-3, and processing fine particles were obtained.
[0126] The same surface qualification as an example 9-1 was performed using the silicone polymer covering talc of nine to example 4 example 1-4, and processing fine particles were obtained.
[0127] The same surface qualification as an example 9-1 was performed using the silicone polymer covering mica titanium of nine to example 5 example 1-5, and processing fine particles were obtained.
[0128] The same surface qualification as an example 9-1 was performed using the silicone polymer covering particle titanium dioxide of nine to example 6 example 1-6, and processing fine particles were obtained.
[0129] The same surface qualification as an example 9-1 was performed using the silicone polymer covering sericite of nine to example 7 example 1-7, and processing fine particles were obtained.
[0130] The same surface qualification as an example 9-1 was performed using the silicone polymer covering particle silica gel of nine to example 8 example 1-8, and processing fine particles were obtained.
[0131] The same surface qualification as an example 9-1 was performed using the silicone polymer covering zinc white of nine to example 9 example 1-9, and processing fine particles were obtained.
[0132] The processing fine particles by which performed the same actuation as an example 2-1 with allyl glycidyl ether, and surface qualification was carried out by the epoxy group were obtained using the silicone polymer covering particle silica gel of ten to example 1 example 1-1.
[0133] The same surface qualification as an example 10-1 was performed using the silicone polymer covering particle titanium dioxide of ten to example 2 example 1-2, and processing fine particles were obtained.
[0134] The same surface qualification as an example 10-1 was performed using the silicone polymer covering sericite of ten to example 3 example 1-3, and processing fine particles were obtained.
[0135] The same surface qualification as an example 10-1 was performed using the silicone polymer covering talc of ten to example 4 example 1-4, and processing fine particles were obtained.
[0136] The same surface qualification as an example 10-1 was performed using the silicone polymer covering mica titanium of ten to example 5 example 1-5, and processing fine particles were obtained.

[0137] The same surface qualification as an example 10-1 was performed using the silicone polymer covering particle titanium dioxide of ten to example 6 example 1-6, and processing fine particles were obtained.
[0138] The same surface qualification as an example 10-1 was performed using the silicone polymer covering sericite of ten to example 7 example 1-7, and processing fine particles were obtained.
[0139] The same surface qualification as an example 10-1 was performed using the silicone polymer covering particle silica gel of ten to example 8 example 1-8, and processing fine particles were obtained.

[0140] The same surface qualification as an example 10-1 was performed using the silicone polymer covering zinc white of ten to example 9 example 1-9, and processing fine particles were obtained.
[0141] Tetra-oar expressed with the following general formula (IIb) in the same actuation as an example 2-1 using the silicone polymer covering particle silica gel of 11 to example 1 example 1-1 [0142]
[Formula 10]



(IIb)

It carried out by having been alike and the processing fine particles by which surface qualification was carried out by the epoxy group were obtained.
[0143] The same surface qualification as an example 11-1 was performed using the silicone polymer covering particle titanium dioxide of 11 to example 2 example 1-2, and processing fine particles were obtained.
[0144] The same surface qualification as an example 11-1 was performed using the silicone polymer covering sericite of 11 to example 3 example 1-3, and processing fine particles were obtained.
[0145] The same surface qualification as an example 11-1 was performed using the silicone polymer covering talc of 11 to example 4 example 1-4, and processing fine particles were obtained.
[0146] The same surface qualification as an example 11-1 was performed using the silicone polymer covering mica titanium of 11 to example 5 example 1-5, and processing fine particles were obtained.
[0147] The same surface qualification as an example 11-1 was performed using the silicone polymer covering particle titanium dioxide of 11 to example 6 example 1-6, and processing fine particles were obtained.
[0148] The same surface qualification as an example 11-1 was performed using the silicone polymer covering sericite of 11 to example 7 example 1-7, and processing fine particles were obtained.
[0149] The same surface qualification as an example 11-1 was performed using the silicone polymer covering particle silica gel of 11 to example 8 example 1-8, and processing fine particles were obtained.
[0150] The same surface qualification as an example 11-1 was performed using the silicone polymer covering zinc white of 11 to example 9 example 1-9, and processing fine particles were obtained.
[0151]
Example 12 : Foundation A combination component The processing fine particles of the weight % (1) example 6-3 10.0 (2) titanium dioxides A 13.0(3) colloidal kaolin 25.0 (4) talc 34.7 (5) red ocher 1.0 (6) yellow oxide of iron 2.5 (7) black oxide of iron 0.1 (8) liquid paraffins 8.0 (9) sorbitan sesquioleate 3.5 (10) glycerol 2.0 (11) ethylparabens The 0.2 process above-mentioned component (1) - (7) was mixed and it ground in mean particle diameter of 1-5 micrometers through the grinder. This was moved to the high-speed blender, and the component (10) was added and it mixed. Apart from this, a component (8), (9), and (11) were mixed, and what was made into homogeneity was added to the above-mentioned mixture, and it mixed to homogeneity further. This was processed with the grinder, the screen was pressed after preparing through grain size, and cake mold foundation was obtained. The obtained foundation had good makeup rice cake.

[0152]
Example 13 : Emulsification foundation A combination component Weight % (A) ion exchange water 43.5 Sodium chondroitin sulfate 1.0 Sodium lactate 0.5 1, 3-butylene glycol 3.0 Methylparaben optimum dose (B) dimethylpolysiloxane (20cs) 16.0 Decamethyl cyclopentasiloxane 5.0 Silicone resin 1.0 cetyl iso OKUTANETO 1.0 polyoxyalkylene denaturation organopolysiloxane 4.0 (20% of rates of denaturation)
An antioxidant Optimum dose Perfume Optimum dose (C) Synthetic Ochre 1.0 A red iron oxide 0.45 Black iron oxide 0.2 Processing fine particles of an example 2-2 11.7 Processing fine particles of an example 5-3 Addition distribution of the fine particles of a component (C) was carried out for 11.65 process components (B) after the heating dissolution. Addition emulsification of the component (A) which carried out the melt heat further beforehand was carried out, it cooled to the room temperature, and emulsification foundation was obtained.
[0153] In the formula of example of comparison 1 example 13, the emulsification foundation of the example 1 of a comparison was obtained like the example 13 except having replaced the processing fine particles of the example 2-2 in a component (C) with the unsettled titanium dioxide.
[0154] Compared with the thing of the example 1 of a comparison, the dispersibility of a titanium dioxide was good, the thing of an example 13 was finished finely and its sunscreen effectiveness was high.
[0155]
Example 14 : Presto powder A combination component The processing fine particles of the weight % (1) example 9-4 The processing fine particles of the 30.0 (2) example 7-3 65.8 (3) iron oxide pigments 0.1 (4) squalane 2.0(5)2-ethylhexyl palmitate 2.0 (6) perfume The 0.1 process above-mentioned component (1), (2), and (3) were mixed with the Henschel mixer, what carried out heating mixing of a component (4) and (5) was sprayed on this, and it ground after mixing, it cast to the inside pan, and presto powder was obtained. The obtained presto powder had a moisturizincy effect and its makeup **** was good.
[0156]
Example 15 : An ultraviolet-rays defense stick A combination component The processing fine particles of the weight % (1) example 2-2 The processing fine particles of the 20.0 (2) example 5-4 The processing fine particles of the 10.0 (3) example 5-3 11.0 (4) iron oxides (red, yellow, black) 0.5 (5) carnauba waxes 1.0 (6) solid paraffin 3.0 (7) liquid paraffins 45.0 (8) isopropyl myristate 8.0 (9) sorbitansesquiolate 1.5 (10) perfume The optimum dose process above-mentioned component (7) and (8) are slushed into an iron pot, and it warms at 80-90 degrees C, and a component (5) and (6) were added and it was made to dissolve. Component (1) - (4) was added to this, and it distributed to homogeneity, and after degassing, the component (10) was added and it stirred gently. The ultraviolet-rays defense stick was obtained by slushing this into a container at 80 degrees C, and cooling to a room temperature. The ultraviolet-rays defense effectiveness of the obtained stick was high.
[0157]
Example 16 : A lip stick A combination component A weight %(1) hydrocarbon wax 3.0 (2) carnauba waxes 1.0(3) glyceryl isostearate 40.0 (4) liquid paraffins The processing fine particles of the 45.8 (5) example 7-2 4.0 (6) iron oxides, sericite mixing fine particles 6.0 (7) perfume The 0.2 process above-mentioned component (1) - (4) was melted at 85 degrees C, and it added, stirring a component (5) and (6) in it. Subsequently, the component (7) was added under stirring. The obtained mixture was inserted in the container. The obtained lip stick was a thing with the outstanding dispersibility.
[0158]
Example 17 : Sun-block cream A combination component Weight %(A) decamethyl cyclopentasiloxane 42.0 A polyethylene glycol 5.0 A dispersant Optimum dose (B) cetyl alcohol 5.0 Vaseline 10.0 Dimethylpolysiloxane (10cs / 25 degrees C) 5.0 Methylphenyl polysiloxane (20cs / 25 degrees C) 5.0 Microcrystalline wax 5.0 Glyceryl monostearate 3.0 Polyoxyethylenesorbitan monostearate 3.0 perfume Optimum dose Antiseptics Optimum dose Antioxidant Processing fine particles 5.0 of the optimum dose (C) example 2-2 Color pigment After carrying out the heating dissolution of the optimum dose process

(A) phase, the (C) phase was added and homogeneity was distributed by the homomixer. What carried out the heating dissolution of the (B) phase could be added to it, it stirred, and sun-block cream was obtained by carrying out stirring cooling after distributing to homogeneity by the homomixer. The obtained cream had the high sunscreen effectiveness.

[0159]

Example 18 : Body powder A combination component Weight % (A) talc 50.0 The processing fine particles of an example 8-4 39.0 A pearl agent 1.0 Color pigment Optimum dose (B) zinc white 3.0 (C) magnesium stearates 4.0 Liquid paraffin 1.0 Germicide Optimum dose (D) perfume An optimum dose process (A) is mixed with a blender. Perfume (D) is sprayed and homogeneity is mixed, after adding (B) to this, mixing to it and adding and toning (C). After the grinder ground this, body powder was obtained by letting a screen pass. The obtained body powder had the high deodorization effectiveness.

[0160] Example 19: 20g of processing fine particles and 18g (Mn48,200, Mw/Mn2.56) of acrylic resin solutions obtained in the coating example 4-2 were kneaded for 20 minutes with the paint shaker with glass bead 70g, and the coating was obtained. The obtained coating had high lightfastness.

[0161] Example 20: The processing fine particles obtained in the container example 4-3 were mixed 2% of the weight in polyethylene, and injection molding of the white polystyrene wide mouthed bottle was carried out.

[0162] Injection molding of the white polystyrene wide mouthed bottle was carried out without mixing processing fine particles as an example of example of comparison 2 comparison.

[0163] When the piece of 4cmx4cm magnitude was cut out from the wide mouthed bottle of an example 20 and the example 2 of a comparison, respectively and the ultraviolet absorption spectrum (diffused reflection method) was measured, the ultraviolet absorption effectiveness high to the direction of the piece obtained in the example 20 was seen.

[0164]

[Effect of the Invention] As explained in full detail above, to the fine particles which the silicone compound which has a Si-H radical covered in this invention in the manufacture approach of processing fine particles Since it constituted so that only water might be substantially used as a reaction solvent when adding a Si-H radical and the compound which can react While being able to attain reduction-ization of a manufacturing cost, the effectiveness which mitigation-ized the burden also in environmental sides, such as wastewater, that the manufacture approach of safe and stable processing fine particles can be offered is done so. Moreover, improvement in the manufacture effectiveness of the product using the processing fine particles obtained by the above-mentioned manufacture approach, reduction of a manufacturing cost, reservation of the stability of product quality and safety, mitigation of the load on an activity in the economy top list in respect of an environmental cure, etc. can be aimed at.

[Translation done.]